

Pre Revision

# Study & Evaluation Scheme

of

## Doctor of Pharmacy

(Pharm D./~~Pharm D~~ Post baccalaureate)

### Programme

[Applicable w.e.f. Academic Session 2013-14 till revised]

[Approved by AC/EC meeting date September 21, 2013]



## TEERTHANKERMAHAVEERUNIVERSITY

N.H.-24, Delhi Road, Moradabad, Uttar Pradesh-244001

Website: [www.tmu.ac.in](http://www.tmu.ac.in)





**Programme: Pharm. D****First Year**Applicable to those who opt **Remedial Mathematics:**

S.N.	Course Code	Subject	Periods			Credits	Evaluation Scheme		
			L	T	P		Internal	External	Total
1	PDR101	Human Anatomy and Physiology	3	1	-	3.5	30	70	100
2	PDR102	Pharmaceutics	2	1	-	2.5	30	70	100
3	PDR103	Medicinal Biochemistry	3	1	-	3.5	30	70	100
4	PDR104	Pharmaceutical Organic Chemistry	3	1	-	3.5	30	70	100
5	PDR105	Pharmaceutical Inorganic Chemistry	2	1	-	2.5	30	70	100
6	PDR106	Remedial Mathematics	3	4	-	5.0	30	70	100
7	PDR151	Human Anatomy and Physiology (P)	-	-	3	1.5	30	70	100
8	PDR152	Pharmaceutics (P)	-	-	3	1.5	30	70	100
9	PDR153	Medicinal Biochemistry (P)	-	-	3	1.5	30	70	100
10	PDR154	Pharmaceutical Organic Chemistry (P)	-	-	3	1.5	30	70	100
11	PDR155	Pharmaceutical Inorganic Chemistry (P)	-	-	3	1.5	30	70	100
<b>Total</b>			<b>16</b>	<b>09</b>	<b>15</b>	<b>28</b>	<b>360</b>	<b>840</b>	<b>1200</b>

**First Year**Applicable to those who opt **Remedial Biology:**

S.N.	Course Code	Subject	Periods			Credits	Evaluation Scheme		
			L	T	P		Internal	External	Total
1	PDR101	Human Anatomy and Physiology	3	1	-	3.5	30	70	100
2	PDR102	Pharmaceutics	2	1	-	2.5	30	70	100
3	PDR103	Medicinal Biochemistry	3	1	-	3.5	30	70	100
4	PDR104	Pharmaceutical Organic Chemistry	3	1	-	3.5	30	70	100
5	PDR105	Pharmaceutical Inorganic Chemistry	2	1	-	2.5	30	70	100
6	PDR107	Remedial Biology	3	1	-	3.5	30	70	100
7	PDR151	Human Anatomy and Physiology (P)	-	-	3	1.5	30	70	100
8	PDR152	Pharmaceutics (P)	-	-	3	1.5	30	70	100
9	PDR153	Medicinal Biochemistry (P)	-	-	3	1.5	30	70	100
10	PDR154	Pharmaceutical Organic Chemistry (P)	-	-	3	1.5	30	70	100
11	PDR155	Pharmaceutical Inorganic Chemistry (P)	-	-	3	1.5	30	70	100
12	PDR156	Remedial Biology (P)	-	-	3	1.5	30	70	100
<b>Total</b>			<b>16</b>	<b>06</b>	<b>18</b>	<b>28</b>	<b>360</b>	<b>840</b>	<b>1200</b>





### Second Year

S.N.	Course Code	Subject	Periods			Credits	Evaluation Scheme		
			L	T	P		Internal	External	Total
1	PDR201	Pathophysiology	3	1		3.5	30	70	100
2	PDR202	Pharmaceutical Microbiology	3	1		3.5	30	70	100
3	PDR203	Pharmacognosy & Phytopharmaceuticals	3	1		3.5	30	70	100
4	PDR204	Pharmacology-I	3	1		3.5	30	70	100
5	PDR205	Community Pharmacy	2	1		2.5	30	70	100
6	PDR206	Pharmacotherapeutics-I	3	1		3.5	30	70	100
7	PDR251	Pharmaceutical Microbiology (P)			3	1.5	30	70	100
8	PDR252	Pharmacognosy & Phytopharmaceuticals (P)			4	2.0	30	70	100
9	PDR253	Pharmacotherapeutics-I (P)			3	1.5	30	70	100
		<b>Total</b>	<b>17</b>	<b>06</b>	<b>10</b>	<b>25</b>	<b>270</b>	<b>630</b>	<b>900</b>

### Third Year

S. N.	Course Code	Subject	Periods			Credits	Evaluation Scheme		
			L	T	P		Internal	External	Total
1	PDR301	Pharmacology -II	3	1	-	3.5	30	70	100
2	PDR302	Pharmaceutical Analysis	3	1	-	3.5	30	70	100
3	PDR303	Pharmacotherapeutics -II	3	1	-	3.5	30	70	100
4	PDR304	Pharmaceutical jurisprudence	2	-	-	2.0	30	70	100
5	PDR305	Medicinal chemistry	3	1	-	3.5	30	70	100
6	PDR306	Pharmaceutical formulations	2	1	-	2.5	30	70	100
7	PDR351	Pharmacology -II (P)	-	-	3	1.5	30	70	100
8	PDR352	Pharmaceutical Analysis (P)	-	-	3	1.5	30	70	100
9	PDR353	Pharmacotherapeutics -II (P)	-	-	3	1.5	30	70	100
10	PDR354	Medicinal chemistry (P)	-	-	3	1.5	30	70	100
11	PDR355	Pharmaceutical formulations (P)	-	-	3	1.5	30	70	100
		<b>Total</b>	<b>16</b>	<b>05</b>	<b>15</b>	<b>26</b>	<b>330</b>	<b>770</b>	<b>1100</b>





#### Fourth Year

S. N.	Course Code	Subject	Periods			Credits	Evaluation Scheme		
			L	T	P		Internal	External	Total
1	PDR401	Pharmacotherapeutics -III	3	2		4.0	30	70	100
2	PDR402	Hospital Pharmacy	2	2		3.0	30	70	100
3	PDR403	Clinical pharmacy	3	2		4.0	30	70	100
4	PDR404	Biostatistics & Research Methodology	2	2		3.0	30	70	100
5	PDR405	Biopharmaceutics & Pharmacokinetics	3	1		3.5	30	70	100
6	PDR406	Clinical Toxicology	2	1		2.5	30	70	100
7	PDR451	Pharmacotherapeutics -III (P)			4	2.0	30	70	100
8	PDR452	Hospital Pharmacy (P)			4	2.0	30	70	100
9	PDR453	Clinical pharmacy (P)			4	2.0	30	70	100
10	PDR454	Biopharmaceutics & Pharmacokinetics (P)			4	2.0	30	70	100
		<b>Total</b>	<b>15</b>	<b>10</b>	<b>16</b>	<b>28</b>	<b>300</b>	<b>700</b>	<b>1000</b>

#### Fifth Year

S. N.	Course Code	Subject	Periods			Credits	Evaluation Scheme		
			L	S	P		Internal	External	Total
1	PDR501	Clinical Research	3	2	-	4	30	70	100
2	PDR502	Pharmacoepidemiology and Pharmacoeconomics	3	2	-	4	30	70	100
3	PDR503	Clinical Pharmacokinetics & Pharmacotherapeutic Drug Monitoring	2	2	-	3	30	70	100
4	PDR551	Clerkship*	-	4	-	2	30	70	100
5	PDR552	Project Work	-		4***	2	30	70	100**
		<b>Total</b>	<b>8</b>	<b>10</b>	<b>4</b>	<b>15</b>	<b>150</b>	<b>350</b>	<b>500</b>

\*Attending ward round on daily basis. \*\* 30 Marks – 10 seminars & 70 Marks –Thesis work & viva Voce. \*\*\* Maximum 50 hours of hospital posting

#### Sixth year

Internship or residency training including postings in specialty units. Students will independently provide the clinical pharmacy services to the allotted wards.

- Six months in General Medicine department, and
- Two months each in three other specialty departments

- Pediatrics
- Gynecology and Obstetrics
- Psychiatry
- Skin and VD
- Orthopedics

#### ASSESSMENT OF INTERNSHIP:

- The intern shall maintain a record of work which is to be verified and certified by the preceptor (teacher/practitioner) under whom he works. Apart from scrutiny of the record of work, assessment and evaluation of training shall be undertaken by an objective approach using situation tests in knowledge, skills and attitude during and at



*Post Revision*

# Study & Evaluation Scheme Of

## Doctor of Pharmacy

(Pharm. D)

Programme

[Applicable w.e.f. Academic Session - 2019-20 till revised]  
[Framed under section 10 of the Pharmacy Act (8 of 1948) of the Doctor of Pharmacy  
(Pharm.D) course regulations 2008 given by PCI]



**TEERTHANKER MAHAVEER UNIVERSITY**

N.H.-24, Delhi Road, Moradabad, Uttar Pradesh-

244001 Website: [www.tmu.ac.in](http://www.tmu.ac.in)

Pharm D Syllabus as per PCI (2019-20)







**TEERTHANKER MAHAVEER UNIVERSITY**  
(Established under Govt. of U.P. Act No. 30, 2008)  
Delhi Road, Bagarpur, Moradabad (U.P.)

<u>Study &amp; Evaluation Scheme</u>	
<u>SUMMARY</u>	
<b>Institute Name</b>	Teerthanker Mahaveer College of Pharmacy (TMCOP), Delhi Road, Moradabad
<b>Programme</b>	Pharm. D (Doctor of Pharmacy)
<b>Duration</b>	Five year of academics and one year of internship
<b>Medium</b>	English
<b>Minimum Required Attendance</b>	80 %
<u>Credits</u>	
<b>Maximum Credits</b>	294
<b>Minimum Credits Required for Degree</b>	294

**A. Program Structure-Pharm. D**

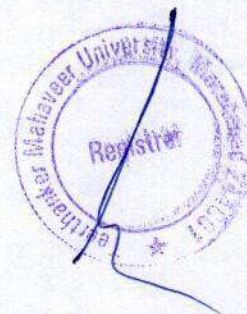
**Pharm. D:** The duration of the program shall be six academic years (five years of study and one year of internship or residency) full time with each academic year spread over a period of not less than two hundred working days.

The period of six years duration is divided into two phases –

**Phase I** – consisting of First, Second, Third, Fourth and Fifth academic year.

**Phase II** – consisting of internship or residency training during sixth year involving posting in speciality units. It is a phase of training wherein a student is exposed to actual pharmacy practice or clinical pharmacy services and acquires skill under supervision so that he or she may become capable of functioning independently.

Pharm D Syllabus as per PCI (2019-20)





## Program Outcomes and Program Specific Outcomes (PSOs)

The learning and abilities or skills that a student would have developed by the end of six-year Pharm.D

### Program Outcomes (POs):

Sl. No.	Program Outcomes (POs)
1.	Acquiring and retrieve sound knowledge on fundamental principles and their applications in the area of Pharmaceutical Sciences.
2.	Understanding and communicate the value of pharmacist's professional roles in society (e.g. health care professionals, promoters of health, educators, managers, employers, employees).
3.	Developing ability for in-depth analytical and critical thinking in order to identify, formulate and solve the issues related to Pharmaceutical Industry, Regulatory Agencies, Hospital and Community Pharmacy Services.
4.	Developing written and oral communication skills.
5.	Developing creativity to solve need based problems in pharmaceutical Industry as well as in healthcare systems for raising quality use of medicine.
6.	Developing professional ethics, entrepreneurship, leadership and team spirit.

### Program Specific Outcomes (PSOs):

Sl. No.	Program Outcomes (PSOs)
1.	Understanding the basic concepts of homeostasis, disease etiology and therapeutic management with their principles and applications.
2.	Understanding the various concepts of development of drug and pharmaceuticals
3.	Describing various requirements and methodology used for manufacturing and quality control of various pharmaceutical and cosmetic products.
4.	Demonstrating use of various instruments and equipment with their standard operating procedures (SOPs) for the analysis of drugs and pharmaceuticals.
5.	Demonstrating the ability to compound extemporaneous and commercially available dosage forms, dispense, and administer medications in a variety of healthcare settings.
6.	Applying standards, guidelines, best practices, and established processes related to safe and effective medication use.
7.	Conducting various pharmaceutical research studies such as identify and report drug related problems, ADRs, drug-drug interactions, drug toxicities, DUR etc. during pharmacy practice in clinics/hospitals.
8.	Developing and providing an evidence-based approach to care that considers the cost, care, access, and satisfaction needs of a targeted patient population.
9.	Developing research instinct in the area of community, hospital and clinical pharmacy.





## B. Choice Based Credit System

The University has adopted the Choice Based Credit System (CBCS). The courses can be evaluated following the grading system, which is considered to be better than the conventional marks system. The following is the course module designed for the Pharm. D program:

**Core Course (CC):** Core courses of Pharm.D program will provide a holistic approach to pharmacy education, giving students an overview of the field, a basis to build and specialize upon. These core courses are the strong foundation to establish pharmacy knowledge and provide broad multi-disciplined knowledge can be studied further in depth during the elective phase. The core courses will provide more practical-based knowledge, case-based lessons and collaborative learning models.

**Ability Enhancement Compulsory Course (AECC):** As per the guidelines of Choice Based Credit System (CBCS) for all Universities, including the private Universities, the Ability Enhancement Compulsory Course (AECC) is a course designed to develop the ability of students in communication (especially English) and other related courses where they might find it difficult to communicate at a higher level in their prospective job at a later stage due to lack of practice and exposure in the language, etc. Students are motivated to learn the theories, fundamentals and tools of communication which can help them develop and sustain in the corporate environment and culture. We offer three AECCs to all the students two in Year I & one in Year III of the program.

**Skill Enhancement Course (SEC):** This program has the maximum number of practical course which is designed to provide value-based and/or skill-based knowledge. We offer 18 SECs- across all 5 years. One SEC will carry 3 credits each and the clerkship also included in the SEC which carry 2 credit.

**Bridge Course (BC):** This is a compulsory course based on their HSC Courses. Students studied Physics / Chemistry / Botany / Zoology at HSC will be offered Remedial Mathematics course and students studied Mathematics / Physics / Chemistry at HSC will be offered Remedial Biology course in their first semester. These courses will fill the gap in their basic knowledge which will help to understand other core courses.

**Value Added Course (VAC):** A value added course is basically meant to enhance general ability of students in areas like soft skills, quantitative aptitude and reasoning ability - required for the overall development of a student and at the same time crucial for industry/corporate demands and requirements. The student possessing these skills will definitely develop acumen to perform well during the recruitment process of any premier organization and will have the desired confidence to face the interview. Moreover, these skills are also essential in day-to-day life in the corporate world. The aim is to nurture every student for making effective communication, developing aptitude and a general reasoning ability for a better performance, as desired in corporate world. There shall be two courses in Year II. There will be a non-credit CTLD course also for the students which carry no credits, however, it will be compulsory for every student to pass these courses with minimum 45% marks to be eligible for the certificate. These marks will





not be included in the calculation of CGPI. Students have to specifically be registered in these courses in the respective semesters.

**Open Elective (Interdisciplinary) Course (OEC):** The open elective course is chosen from an unrelated discipline with an intention to seek exposure. The student will have to choose any one open elective courses (OECs) out of two courses namely First-Aid and Emergency care offered by College of Paramedical Sciences, TMU. Each OEC will carry 3 credits.

Pharm. D: 6 Year CBCS Programme			
Basic Structure: Distribution of Courses			
S.No.	Type of Course	Credit Hours	Total Credits
1	Core Course (CC)	17 Courses of 8 Credit Hrs. each (Total Credit Hrs. 17X8) 08 Courses of 6 Credit Hrs. each (Total Credit Hrs. 8X6) 01 Courses of 4 Credit Hrs. each (Total Credit Hrs. 1X4)	188
2	Ability-Enhancement Compulsory Course (AECC)	1 Course of 6 Credit Hrs. each (Total Credit Hrs. 1X6) 1 Course of 4 Credit Hrs. each (Total Credit Hrs. 1X4) 1 Course of 2 Credit Hrs. each (Total Credit Hrs. 1X2)	12
3	Open Elective Course (OEC)	01 Courses of 3 Credit Hrs. each (Total Credit Hrs. 1X3)	03
4	Skill-Enhancement Course (SEC)	17 Courses of 3 Credit Hrs. each (Total Credit Hrs. 17X3) 1 Course of 2 Credit Hrs. each (Total Credit Hrs. 1X2)	53
5	Bridge Course (BC)	1 Course of 12 Credit Hrs. each (Total Credit Hrs. 1X12) OR 1 Course of 8 Credit Hrs. each (Total Credit Hrs. 1X8) 1 Course of 4 Credit Hrs. each (Total Credit Hrs. 1X4)	12
6	Value Added Course (VAC)	1 Course of 4 Credit Hrs. each (Total Credit Hrs. 1X4) 1 Course of 2 Credit Hrs. each (Total Credit Hrs. 1X2) 2 Courses of 0 Credit Hrs. (CTLD)	06
7	Project Work (PW)	1 Course of 20 Credit Hrs. each (Total Credit Hrs. 1X20)	20
Total Credits			294

Pharm D Syllabus as per PCI (2019-20)





### C. Course Structure- Pharm. D [Pharmacy Council of India]

The course of study for Pharm. D. shall include the Courses as given in the Tables below. The number of hours in a week, devoted to each Course for its teaching in theory, practical and tutorial shall not be less than that noted against it in columns.

#### First Year

S.N.	Category	Course Code	Course	Periods			Credits
				L	T	P	
1	CC-1	PDR101	Human Anatomy and Physiology	3	1	-	8
2	CC-2	PDR102	Pharmaceutics	2	1	-	6
3	CC-3	PDR103	Medicinal Biochemistry	3	1	-	8
4	CC-4	PDR104	Pharmaceutical Organic Chemistry	3	1	-	8
5	CC-5	PDR105	Pharmaceutical Inorganic Chemistry	2	1	-	6
6	BC-1	PDR106	Remedial Mathematics <sup>#</sup>	3	3	-	12
7	BC-2	PDR107	Remedial Biology <sup>s</sup>	3	1	-	8
8	SEC-1	PDR151	Human Anatomy and Physiology (P)	-	-	3	3
9	SEC-2	PDR152	Pharmaceutics (P)	-	-	3	3
10	SEC-3	PDR153	Medicinal Biochemistry (P)	-	-	3	3
11	SEC-4	PDR154	Pharmaceutical Organic Chemistry (P)	-	-	3	3
12	SEC-5	PDR155	Pharmaceutical Inorganic Chemistry (P)	-	-	3	3
13	BC-3	PDR156	Remedial Biology (P) <sup>s</sup>			4	4
			<b>Total</b>	<b>19</b>	<b>09</b>	<b>19</b>	<b>63</b>

<sup>s</sup>Applicable to those who opt Remedial Biology

<sup>#</sup>Applicable to those who opt Remedial Mathematics

#### Second Year

S.N.	Category	Course Code	Course	Periods			Credits
				L	T	P	
1	CC-6	PDR201	Pathophysiology	3	1		8
2	CC-7	PDR202	Pharmaceutical Microbiology	3	1		8
3	CC-8	PDR203	Pharmacognosy & Phytopharmaceuticals	3	1		8
4	CC-9	PDR204	Pharmacology-I	3	1		8
5	CC-10	PDR205	Community Pharmacy	2	1		6
6	CC-11	PDR206	Pharmacotherapeutics-I	3	1		8
7	AECC-1	PDR207	Communication Skill*	2	-	-	4
8	VAC-1	PDR208	Computer Applications in Pharmacy*	2			4
9	SEC-6	PDR251	Pharmaceutical Microbiology (P)			3	3
10	SEC-7	PDR252	Pharmacognosy & Phytopharmaceuticals (P)			3	3
11	SEC-8	PDR253	Pharmacotherapeutics-I (P)			3	3
12	AECC-2	PDR254	Communication Skill*	-	-	2	2

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13	VAC-2	PDR255	Computer Applications in Pharmacy*			2	2
			<b>Total</b>	<b>21</b>	<b>06</b>	<b>13</b>	<b>67</b>

\*Non university course

### Third Year

S.N.	Category	Course Code	Course	Periods			Credits
				L	T	P	
1	CC-12	PDR301	Pharmacology –II	3	1	-	8
2	CC-13	PDR302	Pharmaceutical Analysis	3	1	-	8
3	CC-14	PDR303	Pharmacotherapeutics -II	3	1	-	8
4	CC-15	PDR304	Pharmaceutical jurisprudence	2	-	-	4
5	CC-16	PDR305	Medicinal chemistry	3	1	-	8
6	CC-17	PDR306	Pharmaceutical formulations	2	1	-	6
7	AECC-3	PDR307	Environmental sciences*	3	-	-	6
8	SEC-9	PDR351	Pharmacology –II (P)	-	-	3	3
9	SEC-10	PDR352	Pharmaceutical Analysis (P)	-	-	3	3
10	SEC-11	PDR353	Pharmacotherapeutics -II (P)	-	-	3	3
11	SEC-12	PDR354	Medicinal chemistry (P)	-	-	3	3
12	SEC-13	PDR355	Pharmaceutical formulations (P)	-	-	3	3
			<b>Total</b>	<b>19</b>	<b>05</b>	<b>15</b>	<b>63</b>

\*Non university course

### Fourth Year

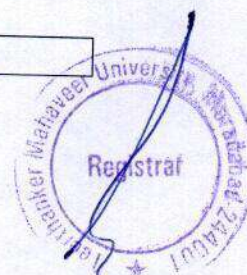
S.N.	Category	Course Code	Course	Periods			Credits
				L	T	P	
1	CC-18	PDR401	Pharmacotherapeutics -III	3	1		8
2	CC-19	PDR402	Hospital Pharmacy	2	1		6
3	CC-20	PDR403	Clinical pharmacy	3	1		8
4	CC-21	PDR404	Biostatistics & Research Methodology	2	1		6
5	CC-22	PDR405	Biopharmaceutics & Pharmacokinetics	3	1		8
6	CC-23	PDR406	Clinical Toxicology	2	1		6
7	SEC-14	PDR451	Pharmacotherapeutics -III (P)			3	3
8	SEC-15	PDR452	Hospital Pharmacy (P)			3	3
9	SEC-16	PDR453	Clinical pharmacy (P)			3	3
10	SEC-17	PDR454	Biopharmaceutics & Pharmacokinetics (P)			3	3
			<b>Total</b>	<b>15</b>	<b>6</b>	<b>12</b>	<b>54</b>

### Value Added Course (VAC)

S.N.	Category	Course Code	Course/Paper	Periods	
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Pharm D Syllabus as per PCI (2019-20)

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				L	T	P	Credit
11	VAC-3	TMUPS 402	Managing Self	02	1	-	00

#### Fifth Year

S. N.	Category	Course Code	Course	Periods			Credits
				L	S	P	
1	CC-24	PDR501	Clinical Research	3	1	-	8
2	CC-25	PDR502	Pharmacoepidemiology and Pharmacoeconomics	3	1	-	8
3	CC-26	PDR503	Clinical Pharmacokinetics & Pharmacotherapeutic Drug Monitoring	2	1	-	6
4	SEC-18	PDR551	Clerkship*	-	1	-	2
5	PW-1	PDR552	Project Work (Six Months)	-	-	20	20
			<b>Total</b>	<b>8</b>	<b>4</b>	<b>20</b>	<b>44</b>

#### Value Added Course (VAC)

S.N.	Category	Course Code	Course/Paper	Periods			Credit
				L	T	P	
6	VAC-4	TMUPS 502	Managing Work and Others	02	1	-	00

#### Sixth Year

##### Internship:

Internship or residency training including postings in specialty units. Students will independently provide the clinical pharmacy services to the allotted wards.

- Six months in General Medicine department, and
- Two months each in three other specialty departments

- Pediatrics
- Gynecology and Obstetrics
- Psychiatry
- Skin and VD
- Orthopedics

**Open Elective Course (OEC):** Students have to select one open elective (interdisciplinary) course from the following two courses offered by College of Paramedical Sciences, TMU, during their internship.

1. First Aid (PAR-501) - 3 credits
2. Emergency Care (PAR-502) - 3 credits

Pharm D Syllabus as per PCI (2019-20)





The college will hold class tests as per the University Academic Calendar. The thirdclass test would be held on completion of the Annual classes and during the preparatory leave for the year end examination. The evaluated answer scripts shall be shown to the students by the faculty and the same shall be discussed for improvement in the class during tutorials.

The internal assessment marks shall be submitted to the HOD by each faculty. The HOD will compile the class marks and send the same to the Academic Review Committee for review, records and its onward transmission to the Controller of Examinations.

#### For Practical

S. No.	Evaluation	Weightage out of 30 Marks
1	Performance in Practical (Experiment, file preparation & viva)	10
2	Internal practical exam & Viva Voce	15
3	Attendance	5
	<b>Total</b>	<b>30</b>

Note: Marks for attendance would be given as per the following criteria:

Attendance - +90% - 5 marks; 85 to 90% - 4 marks; 80-85% - 3 marks; 75-80% - 2 marks; less than 75% - 1 (one) mark

The examinations carrying maximum marks for each part of a Course as indicated in Tables below:

#### First Year

S.N.	Category	Course Code	Course	Credits	Evaluation Scheme		
					Internal	External	Total
1	CC-1	PDR101	Human Anatomy and Physiology	8	30	70	100
2	CC-2	PDR102	Pharmaceutics	6	30	70	100
3	CC-3	PDR103	Medicinal Biochemistry	8	30	70	100
4	CC-4	PDR104	Pharmaceutical Organic Chemistry	8	30	70	100
5	CC-5	PDR105	Pharmaceutical Inorganic Chemistry	6	30	70	100
6	BC-1	PDR106	Remedial Mathematics <sup>#</sup>	12	30	70	100
7	BC-2	PDR107	Remedial Biology <sup>s</sup>	8	30	70	100
8	SEC-1	PDR151	Human Anatomy and Physiology (P)	3	30	70	100
9	SEC-2	PDR152	Pharmaceutics (P)	3	30	70	100
10	SEC-3	PDR153	Medicinal Biochemistry (P)	3	30	70	100
11	SEC-4	PDR154	Pharmaceutical Organic Chemistry (P)	3	30	70	100
12	SEC-5	PDR155	Pharmaceutical Inorganic Chemistry (P)	3	30	70	100
13	BC-3	PDR156	Remedial Biology (P) <sup>s</sup>	4	30	70	100

Pharm D Syllabus as per PCI (2019-20)





			<b>Total</b>	<b>63</b>	<b>390</b>	<b>910</b>	<b>1300</b>
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\*Non university course

<sup>s</sup>Applicable to those who opt **Remedial Biology**

<sup>#</sup>Applicable to those who opt **Remedial Mathematics**

### Second Year

S.N.	Category	Course Code	Course	Credits	Evaluation Scheme		
					Internal	External	Total
1	CC-6	PDR201	Pathophysiology	8	30	70	100
2	CC-7	PDR202	Pharmaceutical Microbiology	8	30	70	100
3	CC-8	PDR203	Pharmacognosy & Phytopharmaceuticals	8	30	70	100
4	CC-9	PDR204	Pharmacology-I	8	30	70	100
5	CC-10	PDR205	Community Pharmacy	6	30	70	100
6	CC-11	PDR206	Pharmacotherapeutics-I	8	30	70	100
7	AECC -1	PDR207	Communication Skill*	4	30	70	100
8	VAC-1	PDR208	Computer Applications in Pharmacy*	4	30	70	100
9	SEC-6	PDR251	Pharmaceutical Microbiology (P)	3	30	70	100
10	SEC-7	PDR252	Pharmacognosy & Phytopharmaceuticals (P)	3	30	70	100
11	SEC-8	PDR253	Pharmacotherapeutics-I (P)	3	30	70	100
12	AECC-2	PDR254	Communication Skill*	2	30	70	100
13	VAC-2	PDR255	Computer Applications in Pharmacy*	2	30	70	100
			<b>Total</b>	<b>67</b>	<b>330</b>	<b>770</b>	<b>1100</b>

\*Non university course

### Third Year

S.N.	Category	Course Code	Course	Credits	Evaluation Scheme		
					Internal	External	Total
1	CC-12	PDR301	Pharmacology -II	8	30	70	100
2	CC-13	PDR302	Pharmaceutical Analysis	8	30	70	100
3	CC-14	PDR303	Pharmacotherapeutics -II	8	30	70	100
4	CC-15	PDR304	Pharmaceutical jurisprudence	4	30	70	100
5	CC-16	PDR305	Medicinal chemistry	8	30	70	100
6	CC-17	PDR306	Pharmaceutical formulations	6	30	70	100
7	AECC-3	PDR307	Environmental sciences*	6	30	70	100
8	SEC-9	PDR351	Pharmacology -II (P)	3	30	70	100
9	SEC-10	PDR352	Pharmaceutical Analysis (P)	3	30	70	100
10	SEC-11	PDR353	Pharmacotherapeutics -II (P)	3	30	70	100
11	SEC-12	PDR354	Medicinal chemistry (P)	3	30	70	100
12	SEC-13	PDR355	Pharmaceutical formulations (P)	3	30	70	100
			<b>Total</b>	<b>63</b>	<b>360</b>	<b>840</b>	<b>1200</b>

\*Non university course

Pharm D Syllabus as per PCI (2019-20)





### Fourth Year

S.N.	Category	Course Code	Course	Credits	Evaluation Scheme		
					Internal	External	Total
1	CC-18	PDR401	Pharmacotherapeutics -III	8	30	70	100
2	CC-19	PDR402	Hospital Pharmacy	6	30	70	100
3	CC-20	PDR403	Clinical pharmacy	8	30	70	100
4	CC-21	PDR404	Biostatics & Research Methodology	6	30	70	100
5	CC-22	PDR405	Biopharmaceutics & Pharmacokinetics	8	30	70	100
6	CC-23	PDR406	Clinical Toxicology	6	30	70	100
7	SEC-14	PDR451	Pharmacotherapeutics -III (P)	3	30	70	100
8	SEC-15	PDR452	Hospital Pharmacy (P)	3	30	70	100
9	SEC-16	PDR453	Clinical pharmacy (P)	3	30	70	100
10	SEC-17	PDR454	Biopharmaceutics & Pharmacokinetics (P)	3	30	70	100
<b>Total</b>				<b>54</b>	<b>330</b>	<b>770</b>	<b>1100</b>

### Value Added Course (VAC)

S.N.	Category	Course Code	Course/Paper	Credit	Evaluation Scheme		
					Internal	External	Total
11	VAC-3	TMUPS 402	Managing Self	00	50	50	100

### Fifth Year

S. N.	Category	Course Code	Course	Credits	Evaluation Scheme		
					Internal	External	Total
1	CC-24	PDR501	Clinical Research	8	30	70	100
2	CC-25	PDR502	Pharmacoepidemiology and Pharmacoeconomics	8	30	70	100
3	CC-26	PDR503	Clinical Pharmacokinetics & Pharmacotherapeutic Drug Monitoring	6	30	70	100
4	SEC-18	PDR551	Clerkship*	2	30	70	100
5	PW-1	PDR552	Project Work (Six Months)	20	30	70	100**
<b>Total</b>				<b>44</b>	<b>150</b>	<b>350</b>	<b>500</b>

\*Attending ward round on daily basis.

\*\* 30 Marks – 1 seminars & 70 Marks –Thesis work & viva Voce.

### Value Added Course (VAC)

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S.N.	Category	Course Code	Course/Paper	Credit	Evaluation Scheme		
					Internal	External	Total
6	VAC-4	TMUPS 502	Managing Work and Others	00	50	50	100

### Sixth Year

**Assessment of Internship:** The intern shall maintain a record of work which is to be verified and certified by the preceptor (teacher practitioner) under whom he works. Apart from scrutiny of the record of work, assessment and evaluation of training shall be undertaken by an objective approach using situation tests in knowledge, skills and attitude during and at the end of the training. Based on the record of work and date of evaluation, the Dean or Principal shall issue certificate of satisfactory completion of training following which the university shall award the degree or declare him/her eligible for it.

- i) Satisfactory completion of internship shall be determined on the basis of the following:

(1)	Proficiency of knowledge required for each case management	SCORE 0-5
(2)	The competency in skills expected for providing Clinical Pharmacy Services	SCORE 0-5
(3)	Responsibility, punctuality, work up of case, involvement in patient care	SCORE 0-5
(4)	Ability to work in a team (Behaviour with other healthcare professionals including medical doctors, nursing staff and colleagues).	SCORE 0-5
(5)	Initiative, participation in discussions, research aptitude.	SCORE 0-5

Poor	Fair	Below Average	Average	Above Average	Excellent
0	1	2	3	4	5

### D.2. Clerkship Examination:

Oral examination shall be conducted after the completion of clerkship of students. An external and an internal examiner will evaluate the student. Students may be asked to present the allotted medical cases followed by discussion. Students' capabilities in delivering clinical pharmacy services, pharmaceutical care planning and knowledge of therapeutics shall be assessed.

### D.3. Minimum marks for passing examination

A student shall not be declared to have passed examination unless he or she secures at least 50% marks in each of the Courses separately in the theory examinations including internal marks and at least 50% marks in each of the practical examinations including internal marks. The students securing 60% marks or above in aggregate in all Courses in the Pharm. D. or, Pharm. D. (Post Baccalaureate) course examination, shall be declared to have passed in first class. Students securing 75% marks or above in any





# New COURSE ADDED. (PHARM-D)

<b>Course Code:</b> <b>PDR207</b>	<b>Ability-Enhancement Compulsory Course – I</b> <b>Pharm D.: First Year</b> <b>COMMUNICATION SKILL</b>	<b>L-2</b> <b>T-0</b> <b>P-0</b> <b>C-4</b>
<b>Course Outcomes:</b>	On completion of the course, the students will be :	
<b>CO1.</b>	Understanding the principles and process of communication.	
<b>CO2.</b>	Recognizing the barriers of communication.	
<b>CO3.</b>	Analysing the verbal and non-verbal communication.	
<b>CO4.</b>	Developing interpersonal skills, oral and written communication skills.	
<b>Course Contents:</b>		
<b>Unit-1:</b>	<ul style="list-style-type: none"> <li>• <b>Communication Skills:</b> Introduction, Definition, The Importance of Communication, The Communication Process – Source, Message, Encoding, Channel, Decoding, Receiver, Feedback, Context</li> <li>• <b>Barriers to communication:</b> Physiological Barriers, Physical Barriers, Cultural Barriers, Language Barriers, Gender Barriers, Interpersonal Barriers, Psychological Barriers, Emotional barriers</li> <li>• <b>Perspectives in Communication:</b> Introduction, Visual Perception, Language, Other factors affecting our perspective - Past Experiences, Prejudices, Feelings, Environment.</li> </ul>	<b>07 hours</b>
<b>Unit-2:</b>	<ul style="list-style-type: none"> <li>• <b>Elements of Communication:</b> Introduction, Face to Face Communication - Tone of Voice, Body Language (Non-verbal communication), Verbal Communication, Physical Communication</li> <li>• <b>Communication Styles:</b> Introduction, The Communication Styles Matrix with example for each - Direct Communication Style, Spirited Communication Style, Systematic Communication Style, Considerate Communication Style</li> </ul>	<b>07 hours</b>
<b>Unit-3:</b>	<ul style="list-style-type: none"> <li>• <b>Basic Listening Skills:</b> Introduction, Self-Awareness, Active Listening, Becoming an Active Listener, Listening in Difficult Situations</li> <li>• <b>Effective Written Communication:</b> Introduction, When and When Not to Use Written Communication - Complexity of the Topic, Amount of Discussion' Required, Shades of Meaning, Formal Communication</li> <li>• <b>Writing Effectively:</b> Course Lines, Put the Main Point First, Know Your Audience, Organization of the Message.</li> </ul>	<b>07 hours</b>
<b>Unit-4:</b>	<ul style="list-style-type: none"> <li>• <b>Interview Skills:</b> Purpose of an interview, Do's and Don't's of an interview</li> <li>• <b>Giving Presentations:</b> Dealing with Fears, Planning your Presentation, Structuring Your Presentation, Delivering Your Presentation, Techniques of Delivery.</li> </ul>	<b>05 hours</b>
<b>Unit-5:</b>	<b>Group Discussion:</b> Introduction, Communication skills in group discussion, Do's and Don't's of group discussion	<b>04 hours</b>
<b>Text Books:</b> <b>(Latest Edition)</b>	<ol style="list-style-type: none"> <li>1. <i>Basic communication skills for Technology</i>, Andreja. J. Ruther Ford, 2nd Edition, Pearson Education, 2011</li> <li>2. <i>Communication skills</i>, Sanjay Kumar, Pushpalata, 1<sup>st</sup> Edition, Oxford Press, 2011</li> </ol>	

Pharm D Syllabus as per PCI (2019-20)



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**Reference  
Books:**

1. *Brilliant- Communication skills*, Gill Hasson, 1stEdition, Pearson Life, 2011
2. *The Ace of Soft Skills: Attitude, Communication and Etiquette for success*, GopalaSwamy Ramesh, 5thEdition, Pearson, 2013
3. *Personality development and soft skills*, Barun K Mitra, 1stEdition, Oxford Press, 2011
4. *Bringing out the best in people*, Aubrey Daniels, 2ndEdition, Mc Graw Hill, 1999
5. *Organizational Behaviour*, Stephen. P. Robbins, 1<sup>st</sup> Edition, Pearson, 2013
6. *Developing your influencing skills*, Deborah Dalley, Lois Burton, Margaret, Greenhall, 1st Edition Universe of Learning LTD, 2010
7. *Communication skills for professionals*, Konar nira, 2ndEdition, New arrivals -PHI, 2011
8. *Soft skill for everyone*, Butter Field, 1st Edition, Cengage Learning india pvt.ltd, 2011
9. *Soft skills and professional communication*, Francis Peters SJ, 1stEdition, Mc GrawHill Education, 2011
10. *Effective communication*, John Adair, 4thEdition, Pan Mac Millan, 2009

*\*Latest editions of all the suggested books are recommended.*

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New Course Added

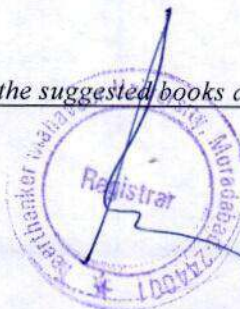
<b>Course Code:</b> PDR208	<b>Value Added Course – 1</b> <b>Pharm D: Second Year</b> <b>COMPUTER APPLICATIONS IN PHARMACY</b>	<b>L-3</b> <b>T-0</b> <b>P-0</b> <b>C-6</b>
<b>Course Outcomes:</b>	On completion of the course, the students will be :	
<b>CO1.</b>	Understanding application of computers in pharmacy.	
<b>CO2.</b>	Recognising concept of information system, software and bioinformatics.	
<b>CO3.</b>	Applying computers for data analysis in preclinical development.	
<b>Course Contents:</b>		
<b>Unit-1:</b>	<b>Number system:</b> Binary number system, Decimal number system, Octal number system, Hexadecimal number systems, conversion decimal to binary, binary to decimal, octal to binary etc, binary addition, binary subtraction – One's complement, Two's complement method, binary multiplication, binary division  <b>Concept of Information Systems and Software:</b> Information requirement and feasibility analysis, data flow diagrams, process specifications, input/output design, process life cycle, planning and managing the project	<b>06 hours</b>
<b>Unit-2:</b>	<b>Web technologies:</b> Introduction to HTML, XML, CSS and Programming languages, introduction to web servers and Server Products. Introduction to databases, MYSQL, MS ACCESS, Pharmacy Drug database	<b>06 hours</b>
<b>Unit-3:</b>	<b>Application of computers in Pharmacy</b> –Drug information storage and retrieval, Pharmacokinetics, Mathematical model in Drug design, Hospital and Clinical Pharmacy, Electronic Prescribing and discharge (EP) systems, barcode medicine identification and automated dispensing of drugs, mobile technology and adherence monitoring, "Diagnostic System, Lab-diagnostic System, Patient Monitoring System, Pharma Information System.	<b>06 hours</b>
<b>Unit-4:</b>	<b>Bioinformatics:</b> Introduction, Objective of Bioinformatics, Bioinformatics, Databases, Concept of Bioinformatics, Impact of Bioinformatics in Vaccine Discovery	<b>06 hours</b>
<b>Unit-5:</b>	<b>Computers as data analysis in Preclinical development:</b> Chromatographic data analysis (CDS), Laboratory Information management System (LIMS) and Text Information Management System (TIMS)	<b>06 hours</b>
<b>Text Books:</b> <b>(Latest Edition)</b>	1. <i>Computer Application in Pharmacy – William E. Fassett –Lea and Febiger, 600 South Washington Square, USA, (215) 922-1330.</i>	
<b>Reference Books:</b>	1. <i>Bioinformatics (Concept, Skills and Applications) – S.C. Rastogi-CBS Publishers and Distributors, 4596/1- A, 11 Darya Gani, New Delhi – 110 002(INDIA)</i> 2. <i>Computer Application in Pharmaceutical Research and Development –Sean Ekins – Wiley- Interscience, A John Willey and Sons, INC., Publication, USA</i> 3. <i>Microsoft office Access - 2003, Application Development Using VBA, SQL Server, DAP and Infopath – Cary N. Prague – Wiley Dreamtech India (P) Ltd., 4435/7, Ansari Road, Daryagani, New Delhi - 110002</i>	





New Course Added

<b>Course Code:</b> PDR254	<b>Ability-Enhancement Compulsory Course – 2</b> <b>Pharm. D: Second Year</b> <b>COMMUNICATION SKILLS (PRACTICAL)</b>	<b>L-0</b> <b>T-0</b> <b>P-2</b> <b>C-2</b>
<b>Course Outcomes:</b>	On completion of the course, the students will be :	
<b>CO1.</b>	Understanding the basics of communication skills.	
<b>CO2.</b>	Applying oral and written communication skills with proper pronunciation and presentation.	
<b>Course Contents:</b>		<b>2 Hrs./ Week</b>
<p>The following learning modules are to be conducted using words worth® English language lab software</p> <p><b>I. Basic communication covering the following topics</b> Meeting People, Asking Questions, Making Friends What did you do? Do's and Dont's</p> <p><b>II. Pronunciations covering the following topics</b> Pronunciation (Consonant Sounds), Pronunciation and Nouns, Pronunciation (Vowel Sounds)</p> <p><b>III. Advanced Learning</b> Listening Comprehension / Direct and Indirect Speech, Figures of Speech, Effective Communication Writing Skills, Effective Writing, Interview Handling Skills, E-Mail etiquette, Presentation Skills</p>		
<b>Text Books:</b> <b>(Latest Edition)</b>	<ol style="list-style-type: none"> <li>1. <i>Basic communication skills for Technology</i>, Andreja. J. Ruther Ford, 2nd Edition, Pearson Education, 2011</li> <li>2. <i>Communication skills</i>, Sanjay Kumar, Pushpalata, 1<sup>st</sup> Edition, Oxford Press, 2011</li> </ol>	
<b>Reference Books:</b>	<ol style="list-style-type: none"> <li>1. <i>Brilliant- Communication skills</i>, Gill Hasson, 1stEdition, Pearson Life, 2011</li> <li>2. <i>The Ace of Soft Skills: Attitude, Communication and Etiquette for success</i>, GopalaSwamy Ramesh, 5thEdition, Pearson, 2013</li> <li>3. <i>Personality development and soft skills</i>, Barun K Mitra, 1stEdition, Oxford Press,2011</li> <li>4. <i>Bringing out the best in people</i>, Aubrey Daniels, 2ndEdition, Mc Graw Hill, 1999</li> <li>5. <i>Organizational Behaviour</i>, Stephen. P. Robbins, 1<sup>st</sup> Edition, Pearson, 2013</li> <li>6. <i>Developing your influencing skills</i>, Deborah Dalley, Lois Burton, Margaret, Greenhall, 1st Edition Universe of Learning LTD, 2010</li> <li>7. <i>Communication skills for professionals</i>, Konar nira, 2ndEdition, New arrivals –PHI, 2011</li> <li>8. <i>Soft skill for everyone</i>, Butter Field, 1st Edition, Cengage Learning india pvt.ltd,2011</li> <li>9. <i>Soft skills and professional communication</i>, Francis Peters SJ, 1stEdition, Mc GrawHill Education, 2011</li> <li>10. <i>Effective communication</i>, John Adair, 4thEdition, Pan Mac Millan,2009</li> </ol> <p><i>*Latest editions of all the suggested books are recommended.</i></p>	





<b>Course Code:</b> <b>PDR255</b>	<b>Value Added Course- 2</b> <b>Pharm.D: Second Year</b>	<b>L-0</b> <b>T-0</b> <b>P-2</b> <b>C-2</b>
<b>COMPUTER APPLICATION IN PHARMACY (PRACTICAL)</b>		
<b>Course Outcomes:</b>	On completion of the course, the students will be :	
<b>CO1.</b>	Understanding basic concepts of HTML and its use in creating websites.	
<b>CO2.</b>	Demonstrating the information of any drug and its adverse effects using online tools.	
<b>CO3.</b>	Deploying MS Office tools to store and retrieve patient information from the Database.	
<b>CO4.</b>	Generating and printing report from patient database.	
<b>Course Contents:</b>		<b>2 Hrs./ Week</b>
<ol style="list-style-type: none"> <li>1. Design a questionnaire using a word processing package to gather information about a particular disease.</li> <li>2. Create a HTML web page to show personal information.</li> <li>3. Retrieve the information of a drug and its adverse effects using online tools</li> <li>4. Creating mailing labels Using Label Wizard, generating label in MS WORD</li> <li>5. Create a database in MS Access to store the patient information with the required fields using access</li> <li>6. Design a form in MS Access to view, add, delete and modify the patient record in the database</li> <li>7. Generating report and printing the report from patient database</li> <li>8. Creating invoice table using – MS Access</li> <li>9. Drug information storage and retrieval using MS Access</li> <li>10. Creating and working with queries in MS Access</li> <li>11. Exporting Tables, Queries, Forms and Reports to web pages</li> <li>12. Exporting Tables, Queries, Forms and Reports to XML pages</li> </ol>		
<b>Text Books:</b> <b>(Latest Edition)</b>	1. <i>Computer Application in Pharmacy – William E. Fassett –Lea and Febiger, 600 South Washington Square, USA, (215) 922-1330.</i>	
<b>Reference Books:</b>	<ol style="list-style-type: none"> <li>1. <i>Bioinformatics (Concept, Skills and Applications) – S.C. Rastogi- CBS Publishers and Distributors, 4596/1- A, 11 Darya Gani, New Delhi – 110002(INDIA)</i></li> <li>2. <i>Computer Application in Pharmaceutical Research and Development –Sean Ekins – Wiley- Interscience, A John Willey and Sons, INC., Publication,USA</i></li> <li>3. <i>Microsoft office Access - 2003, Application Development Using VBA, SQL Server, DAP and Infopath – Cary N. Prague – Wiley Dreamtech India (P) Ltd., 4435/7, Ansari Road, Daryagani, New Delhi -110002.</i></li> </ol>	

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New course Added

<b>Course Code:</b> <b>PDR307</b>	<b>Ability-Enhancement Compulsory Course – 3</b> <b>Pharm.D: Third Year</b>	<b>L-3</b> <b>T-0</b> <b>P-0</b> <b>C-6</b>
	<b>ENVIRONMENTAL SCIENCES</b>	
<b>Course Outcomes:</b>	On completion of the course, the students will be :	
<b>CO1.</b>	Understanding concepts & sources of environment and its associated problems and measures to control.	
<b>CO2.</b>	Describing the ecosystems.	
<b>CO3.</b>	Analysing human impacts on the environment.	
<b>Course Contents:</b>		
<b>Unit-1:</b>	The Multidisciplinary nature of environmental studies Natural Resources, Renewable and non-renewable resources: Natural resources and associated problems Forest resources; a) Water resources; b) Mineral resources; c) Food resources; d) Energy resources; e) Land resources: Role of an individual in conservation of natural resources.	<b>10 hours</b>
<b>Unit-2:</b>	Ecosystems, Concept of an ecosystem. Structure and function of an ecosystem. Introduction, types, characteristic features, structure and function of the ecosystems: Forest ecosystem; Grassland ecosystem; Desert ecosystem; Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)	<b>10 hours</b>
<b>Unit-3:</b>	Environmental Pollution: Air pollution; Water pollution; Soil pollution.	<b>10 hours</b>
<b>Text Books:</b> <b>(Latest Edition)</b>	1. Y.K. Sing, <i>Environmental Science</i> , New Age International Pvt, Publishers, Bangalore 2. Agarwal, K.C. 2001 <i>Environmental Biology</i> , Nidi Publ. Ltd. Bikaner. 3. Bharucha Erach, <i>The Biodiversity of India</i> , Mapin Publishing Pvt. Ltd., Ahmedabad – 380 013, India,	
<b>Reference Books:</b>	1. Brunner R.C., 1989, <i>Hazardous Waste Incineration</i> , McGraw Hill Inc. 480p 2. Clark R.S., <i>Marine Pollution</i> , Clanderson Press Oxford 3. Cunningham, W.P. Cooper, T.H. Gorhani, E & Hepworth, M.T. 2001, <i>Environmental Encyclopedia</i> , Jaico Publ. House, Mumbai, 1196p 4. De A.K., <i>Environmental Chemistry</i> , Wiley Eastern Ltd. Down of Earth, Centre for Science and Environment	

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## Changes in PharmD syllabus 2013-14 Vs 2019-20

### Course PDR 107 (Remedial Biology)

	Old Course	New Course
<b>Unit-1</b>	Definition of Botany, scope of Botany, origin and continuity of life, importance of green plants, uses of plants, characteristics of living objects- Life-cycle, cellular structure, protoplasm, respiration, reproduction, metabolism, nutrition, growth, movements, (Brownian movement) and difference between the living and nonliving objects, history of plants.	General organization of plants and its inclusions
<b>Unit-2</b>	1. Study of plant cell: structure, chemical composition of chlorophyll, Plant enzymes such as- Hemicellulose, lignin, cutin, suberin, mucilage and micro chemical tests. 2. Non-living Cellular Inclusions:- Carbohydrates, proteins, fats & oils and it's tests, other cell products-tannins, resins, essential oils, gums, mineral crystals (silica, CaCo <sub>3</sub> , calcium oxalate), latex, organic acids, and alkaloids.	Plant tissues, Plant kingdom and its classification
<b>Unit-3</b>	1. Formations of new cells- somatic cell division (mitosis) and meiosis (reproductive cell division) with diagram. 2. Tissue system: Epidermal, ground or fundamental tissue system, vascular & meristematic tissues and permanent tissues. 3. Plant kingdom and it's classification:- Cryptogonia&Phanerogonia / spermatophyta 4. Morphology of plants: Study of general morphology, types, different characteristics of root, stem & leaf. Pollination and fertilization. Modifications of roots, stem & leaf with diagram and suitable examples.	Morphology of plants Root, Stem, Leaf and Its modifications



  
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<b>Unit-4</b>	<p>1. Inflorescence and pollination of flowers: Different parts of flowers, definition, classification, types of inflorescence. Different modes of Pollination of flowers, pollination in compositae, maize, zoophily and hydrophily, advantages and disadvantages of self and cross pollination.</p> <p>2. Fruits and seeds:- Types of fruits and their characteristics, Development of the seed, monocot and dicot seeds e.g. pea, gram &amp; bean. Dispersal of seed and fruits.</p>	<p>Inflorescence and Pollination of flowers Morphology of fruits and seeds</p>
<b>Unit-5</b>	<p>1. Plant physiology:- General consideration of different plant phenomena: N<sub>2</sub> Assimilation, Photosynthesis, colloidal system, Brownian movement, flocculation, diffusion, imbibition, osmosis, difference between osmotic pressure and suction pressure, experiments of osmosis, turgidity &amp; plasmolysis.</p> <p>2. Soils:-Formation of soils, types, physical and chemical properties of soils (acidity and alkalinity), soil organisms like humus &amp; fertilizers (sulphate of ammonia, urea etc). Chemical composition of plant, N<sub>2</sub> fixation by saprophytic- and symbiotic bacteria (nodule formation), N<sub>2</sub> cycle, translocation &amp; transpiration.</p>	<p>Plant physiology Taxonomy of Leguminosae, umbelliferae, Solanaceae, Lilliacae, Zinziberaceae, Rubiaceae Study of Fungi, Yeast, Penicillin and Bacteria</p>
<b>Unit-6</b>	<p>1. Mechanism of photosynthesis: role played by light and chlorophyll, hill reaction, factors affecting photosynthesis.</p> <p>2. Enzymes: Study of classification, sources and function of different enzymes i.e. Cellulase, Pectase, Diastase and Tannase.</p> <p>3. Respiration:- mechanism of respiration, glycolytic pathway, kreb's cycle, Significance of electron</p>	<p>Study of Animal cell Study animal tissues</p>



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	transport system (ETS). 4. Study of some important families: Leguminosae, Umbelliferae, Solanaceae, Lilliaceae, Zinziberaceae and Rubiaceae.	
<b>Unit-7</b>	1. Study of fungi, yeast, penicillin and bacteria:- General classifications, morphological characters and staining techniques. Life cycle of Penicillium & Aspergillus. 2. Structure of animal cell: physical & chemical nature of protoplasm, Asexual reproduction by the fission & conjugation methods. 3. Study of different tissues: Epithelial, Connective, Muscular and Nervous tissues. 4. General characters of Rana trigina (frog): digestive, respiration, blood vascular systems, nervous, reproductive, excretory system and sense organs of frog.	Detailed study of frog Study of Pisces, Raptiles, Aves
<b>Unit-8</b>	1. Study of Pisces, aves&reptiles:- taxonomical study of pharmaceutically important fishes (shark), aves (pigeon) and Raptiles (lizard, snakes). 2. General organization of mammals:- various definitions (Sinoconodon, Morganucodonts& docodonts), distinguishing features, classification, Evolutionary history, Anatomy and morphology, Endothermy of mammals 3. Study of poisonous animals: study of poisonous animals like slow loris, Mexican beaded lizard, snakes, amphibians like salamandrid salamanders	General organization of mammals Study of poisonous animals



  
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## Changes in PharmD syllabus 2013-14 Vs 2019-20

### Course PDR 203 (PHARMACOGNOSY & PHYTOPHARMACEUTICALS)

	Old Course	New Course
Unit -1	Introduction, history, Resources, & scope of Pharmacognosy, Biological, marine, mineral and plant tissue cultures as sources of crude drugs, Novel medicinal agents from marine sources.	Introduction, Definition, history and scope of Pharmacognosy.
Unit -2	Classification of crude drugs: Alphabetical, Morphological, taxonomical, chemical & pharmacological classifications. Study of following families with special reference to medicinally importance plants: apocynaceae, solanaceae, rutaceae, umbellifereae, leguminoseae, rubiaceae, liliaceae, labiateae, acanthaceae, compositae & papaveraceae.	Classification of crude drugs
Unit -3	Cultivation, collection, processing and storage of crude drugs: Factors influencing cultivation of medicinal plants, Type of Soils & fertilizers of common use, Pest Management & natural pest control agents, Plant hormones and their applications, Polyploidy, Mutation & hybridization with reference to medicinal plants and Poly Houses/ Green Houses for cultivation	Cultivation, collection, processing and storage of crude drugs
Unit -4	Detailed method of cultivation of crude drugs: atropa belladonna, cinchona, ginseng, ipecac, lemongrass, opium, Rawolfia serpentina, ergot, seena and Tea.	Detailed method of cultivation of crude drugs:
Unit -5	1. Study of cell wall constituents and cell inclusions in details including mitotic & meiotic cell division. 2. study of morphological & powder microscopical characteristics, surface preparation and chemical tests of: digitalis, senna & vinca leaves, linseed & nux vomica seeds, clove, cinnamon	Study of cell wall constituents and cell inclusions. Microscopical and powder Microscopical study of crude drugs



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	&cinchona barks and ipecacunha, liquorice &rauwfia root	
Unit -6	1. Study of natural pesticides: pyrethrum, neem, derris, sabacdilla, tobacco &ryania. 2. Carbohydrate & related products: detailed studies of carbohydrate containing drugs (11 drugs): Honey, starches, commercial dextrans, xanthan gum, gum acacia, tryacanth, agar, ispaghula, bacl, pectin and inulin	Study of natural pesticides. Detailed study of various cell constituents.
Unit -7	1. Definition sources, method of extraction, chemistry and method of analysis of lipids & fats: castor oil, arachnid oil, olive oils, theobroma, cottonseed oil and palm oil. 2. Detailed study of volatile oils: methods of extraction, chemistry and biosynthesis of monoterpenes. Sources, collection, morphology, microscopical characteristics, chemical constituents and uses of coriander, fennel, cara way, dill, peppermint, cinnamon bark, saffron and camphor. 3. Definition, classification, chemistry & methods of analysis of proteins with special reference to gelatin, diastase, papain and ficin.	Carbohydrates and related products. Detailed study carbohydratescontaining drugs.(11 drugs) Definition sources, method extraction, chemistry and method of analysis of lipids. Detailed study of oils.
Unit-8	1. Study of plant fibres used in surgical dressing & related products with particular emphasis on preparation, chemical tests, physical & chemical characteristics and uses of absorbent cotton, wool, viscose and alginate fibres. 2. Different methods of adulteration of crude drugs with suitable examples	Definition, classification, chemistry and method of analysis of protein. Study of plants fibers used in surgical dressings and related products. Different methods of adulteration of crude drugs.





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## Changes in PharmD syllabus 2013-14 Vs 2019-20

### Course PDR 205 (COMMUNITY PHARMACY)

	Old Course	New Course
<b>Unit-1</b>	Definition & scope of community pharmacy: Community pharmacy in India, Roles and responsibilities of Community pharmacist. Characteristics of Indian community pharmacy, Indian role in Pharmaceutical Industries, Drug therapy & community pharmacists, brief idea of clinical risk management.	Definition & scope of community pharmacy Roles and responsibilities of Community pharmacist
<b>Unit-2</b>	Community Pharmacy Management: Selection of site, Space layout, and design, Staff, Materials- coding, stocking, Legal requirements, Maintenance of various registers, Use of Computers: Business and health care softwares and Inventory control in community pharmacy: Definition, various methods of Inventory Control ABC, VED, EOQ, Lead time, safety stock	Community Pharmacy Management: Selection of site, Space layout, and design, Staff, Materials- coding, stocking, Legal requirements, Maintenance of various registers, Use of Computers: Business and health care softwares. Inventory control in community pharmacy: Definition, various methods of Inventory Control ABC, VED, EOQ, Lead time, safety stock
<b>Unit-3</b>	Prescriptions – parts of prescription, legality & identification of medication related problems like drug interactions. Sources of errors in prescriptions, Conventions and avoiding ambiguity in writing prescription, pharmaceutical incompatibilities, Aims and objectives of Patient's medical records,	Prescriptions – parts of prescription, legality & identification of medication related problems like drug interactions. Pharmaceutical care Definition and Principles of Pharmaceutical care.
<b>Unit-4</b>	Pharmaceutical care Definition and Principles of Pharmaceutical care. Patient counseling: Definition,	Patient counseling: Definition, outcomes, various stages, barriers,



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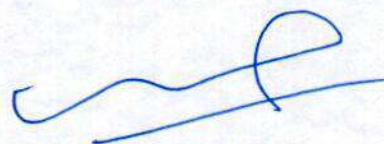
	<p>outcomes, various stages, barriers, Strategies to overcome barriers, Key communication skills &amp; patient counseling for good communication, Patient information leaflets- content, design, &amp; layouts, advisory labels, Patient medication adherence: Definition, Factors affecting medication adherence, role of pharmacist in improving the adherence.</p>	<p>Strategies to overcome barriers. Patient information leaflets- content, design, &amp; layouts, advisory labels. Patient medication adherence: Definition, Factors affecting medication adherence, role of pharmacist in improving the adherence</p>
<b>Unit-5</b>	<p>Health screening services Definition, importance, methods for screening Blood pressure/ blood sugar/ lung function and Cholesterol testing, OTC Medication- Definition, safety considerations of OTC medications, OTC medication list &amp; Counselling</p>	<p>Health screening services Definition, importance, methods for screening. Blood pressure/ blood sugar/ lung function and Cholesterol testing. OTC Medication- Definition, OTC medication list &amp; Counselling.</p>
<b>Unit-6</b>	<p>Health Education: WHO Definition of health, and health promotion, care for children, pregnant &amp; breast feeding women, and geriatric patients. Commonly occurring Communicable Diseases, causative agents, Clinical presentations and prevention of communicable diseases – Tuberculosis, Hepatitis, Typhoid, Amoebiasis, Malaria, Leprosy, Syphilis, Gonorrhea and AIDS, Balance diet, and treatment &amp; prevention of deficiency disorders, Family planning – role of pharmacist</p>	<p>Health Education: WHO Definition of health, and health promotion, care for children, pregnant &amp; breast feeding women, and geriatric patients. Commonly occurring Communicable Diseases, causative agents, Clinical presentations and prevention of communicable diseases – Tuberculosis, Hepatitis, Typhoid, Amoebiasis, Malaria, Leprosy, Syphilis, Gonorrhea and AIDS, Balance diet, and treatment &amp; prevention of deficiency disorders,</p>



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		Family planning – role of pharmacist
<b>Unit-7</b>	Responding to symptoms of minor ailments, Relevant pathophysiology, common drug therapy to Pain, GI disturbances (Nausea, Vomiting, Dyspepsia, diarrhoea, constipation), Pyrexia, Ophthalmic symptoms, worm infestations.	Responding to symptoms of minor ailments: Relevant pathophysiology, common drug therapy to Pain, GI disturbances (Nausea, Vomiting, Dyspepsia, diarrhoea, constipation), Pyrexia, Ophthalmic symptoms, worm infestations.
<b>Unit-8</b>	Essential Drugs concept and Rational Drug Therapy: Pharmaco-epidemiology, role of pharmacists in pharmacoepidemiology, pharmaco-economics, types of pharmacoeconomic evaluation-cost minimization analysis, cost benefit analysis, cost effective analysis, cost utility analysis, Code of ethics- Purpose and scope, application, Code of ethics for community pharmacists in relation to his job, trade & medical profession.	Essential Drugs concept and Rational Drug Therapy, Role of community pharmacist Code of ethics for community pharmacists



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## Changes in PharmD syllabus 2013-14 Vs 2019-20

### Course PDR403 CLINICAL PHARMACY

	Old course	New Course
<b>Unit-1</b>	<p>1. Definitions, Development and scope of clinical pharmacy: Drug Information, Drug Utilization, Drug Evaluation and Selection, Medication Therapy Management, Formal Education and Training Programs, Disease State Management, Application of Electronic Data Processing.</p> <p>2. Introduction to daily activities of a clinical pharmacist: Drug therapy monitoring (medication chart review, clinical review, pharmacist interventions), Ward round participation, Adverse drug reaction management, Drug and poisons information, Medication history, Patient counselin</p>	<p>1. Definitions, Development and scope of clinical pharmacy</p> <p>2. Introduction to daily activities of a clinical pharmacist: Drug therapy monitoring (medication chart review, clinical review, pharmacist interventions), Ward round participation, Adverse drug reaction management, Drug and poisons information, Medication history, Patientcounseling, Drug utilization evaluation (DUE) and review (DUR), Quality assurance of clinical pharmacy services.</p>
<b>Unit-2</b>	<p>1. Drug utilization evaluation (DUE) and review (DUR): Quality assurance of clinical pharmacy services.</p> <p>2. Patient data analysis: Patient's case history, its structure and use in evaluation of drug therapy &amp; Understanding common medical abbreviations and terminologies used in clinical practices.</p> <p>3. Clinical laboratory tests used in the evaluation of</p>	<p>Patient data analysis: Patient's case history, its structure and use in evaluation of drug therapy &amp; Understanding common medical abbreviations and terminologies used in clinical practices.</p>



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	diseased states and interpretation of test results: Detailed Haematological, Liver function, Renal function and thyroid function tests.	
<b>Unit-3</b>	1. Clinical laboratory tests used in the evaluation of diseased states and interpretation of test results: associated with cardiac disorders, Fluid and electrolyte balance, Microbiological culture sensitivity tests and Pulmonary Function Tests	Clinical laboratory tests used in the evaluation of diseased states and interpretation of test results: a. Hematological, Liver function, Renal function, thyroid function tests b. Tests associated with cardiac disorders c. Fluid and electrolyte balance d. Microbiological culture sensitivity tests e. Pulmonary Function Tests
<b>Unit-4</b>	Drug & Poison information: Introduction to drug information resources, Systematic approach in answering Drug Information queries, Critical evaluation of drug information and literature, Preparation of written and verbal reports, Poisons information-organization & information resources	Drug & Poison information: Introduction to drug information resources, Systematic approach in answering Drug Information queries, Critical evaluation of drug information and literature, Preparation of written and verbal reports, Poisons information organization & information res
<b>Unit-5</b>	Establishing a Drug Information Centre: Scope, definition and aims of pharmacovigilance, Adverse drug reactions - Classification, mechanism, predisposing factors and causality assessment [different scales used]. Reporting, evaluation, monitoring, preventing & management of Adverse drug reactions.	Pharmacovigilance a. Scope, definition and aims of pharmacovigilance b. Adverse drug reactions - Classification, mechanism, predisposing factors, causality assessment [different scales used] c. Reporting, evaluation, monitoring, preventing & management of ADRs d. Role of pharmacist in management of ADR.
<b>Unit-6</b>	Role of pharmacist in management of Adverse drug reactions: Communication skills including patient	Communication skills, including patient counselling techniques, medication history interview, presentation of cases.



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	counselling techniques, medication history interview, presentation of cases and critical evaluation of biomedical literature to solve therapeutic dilemma	
<b>Unit-7</b>	1. Pharmaceutical care concepts: Therapeutic Outcome Monitoring, Elderly Medication Analysis, Pharmaceutical Safety Belt, Pharmacy days, Specific diseases and pharmaceutical care (Hypertension, Coronary heart disease, Diabetes, Asthma). 2. Pharmaceutical care programmes: Documentation, monitoring, evaluations and Communication	1. Pharmaceutical care concepts 2. Critical evaluation of biomedical literature
<b>Unit-8</b>	Medication errors: Different types and causes of medication errors, Recommendations for Preventing Medication Errors, Monitoring and Managing Medication Errors.	Medication errors

  
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